REMARKS

The Examiner rejected claims 1, 4-8, and 17-20 under 35 U.S.C. 103(a) as being unpatentable over Hall- Tipping (US 5.001,632) and further in view of Stratton et al.

Applicant respectfully traverses the §103(a) rejections with the following amendments and arguments:

35 U.S.C. § 103

The Examiner rejected claims 1, 4-8, and 17-20 under 35 U.S.C. 103(a) as being unpatentable over Hall- Tipping (US 5,001,632) and further in view of Stratton et al.

Claim 17 is amended and the words "of the subject" are added to show that the point of efficiency in the present invention is linked to the specific subject using the system.

The Examiner rejected claims 1, 4-8, and 17-20 under 35 U.S.C. 103(a) as being unpatentable over Hall-Tipping (US 5,001,632) and further in view of Stratton et al. Applicant respectfully dissents and contends that the disclosures of Hall-Tipping and Stratton et al. do not teach or render obvious the features of the claims, as amended, and hence, the claim limitations are not obvious. Claims 1, 4-8, and 17-20 stand therefore in condition for allowance.

Regarding Claim 1:

The Examiner rejected claim 1 in view of Hall-Tipping (US 5,001,632) in view of Stratton et al. While Hall-Tipping does disclose an "optimal level" of activity, the optimal level is a predetermined range of pulse rate locked between 70% to 80-85% using the formula of 220 minus the user's age in years (see Hall-Tipping col. 5, lines 35-45). Hall-Tipping further discloses that the exerciser must exercise optimally, which means that the exerciser must bear a heart rate falling between the precalculated range, i.e. P max and P min (see Hall-Tipping col. 6, lines 1-11).

The Examiner, however, has asserted that "The Hall-Tipping reference provides a teaching where point of efficiency is determined continuously over a period of time (see

FIG. 3 item "warm-up")." (Final Office Action, Response to Arguments, section 3). On the contrary, FIG. 3 actually discloses that there is an initial period a "warm-up" period where the user's heart rate is slowly raised over a given amount of time. The Hall-Tipping reference states that "An exerciser, prior to commencing a workout, inputs his age, and the preferred duration of his warm-up and workout. According to a preset formula, the controller sets upper and lower heart rates for the duration of the exercise routine." (Col. 4, Lines 36-40). The "Warm-up period – between 5 and 10 minutes. The heart beat should not exceed 50% of the user's maximal heart rate at the conclusion of the warm-up period." (Col. 5, Lines 45-48). Therefore, the "warm-up" period is not used to determine a point of efficiency instead all of the heart rate ranges are predetermined by the user inputting his age and the type of workout he wants. The "warm-up" period is simply a period where the user's heart rate is raised to 50% of the predetermined maximum rate from a resting heart rate (FIG. 3).

The present claim limitations do not use a precalculated range for determining efficiency. Rather, the efficiency is determined by determining the *rate of change* in a parameter. Efficiency is said to be maintained when the rate of change in a parameter is in proportion to the stimulus, like speed or distance. If the rate of change in a parameter changes out of proportion or is not along the line formed or projected by the graph (see Applicant's figs. 2A and 3) of the two values to be compared (see Applicant's specification: page 12, lines 16-19), then such more rapid or less rapid variation is considered an indication of inefficiency as displayed by the subject while exercising (see specification: page 13, lines 7-12). This method is completely different as compared to one using a precalculated range for determining efficiency. The present claim limitations

allow the individual user to demonstrate his or her level of efficiency as opposed to a pre-determined step-like function of the prior art references. It is also clear that for a subject to be inefficient, according to the cited references, he (or she) may only fall outside the precalculated range (pulse rate between 70% to 80-85%) and is thus determined by absolute figures, whereas the present claim limitations provide a completely different approach where the rate of change in a parameter which is not linear as compared to readings before it, or is out of the proportion of a step-like level set by the subject himself (or herself) while performing the exercise to determine the point of efficiency. Thus, a deviation on a line graph or a fluctuation in the values for the *rate of change* in a parameter will commence the announcing of the departure from the state of efficiency.

Furthermore, the Stratton publication titled *Training Program and Maximal Oxygen Consumption* discloses yet again the happening of an absolute step (i.e. exhaustion), as opposed to a rate of change. The training of Stratton consisted of "*6-month training program began at 50% to 60% of heart rate reserve and increased to 80% to 85% by the third-fourth month and continued at that level for the remaining time.* The Stratton publication is silent regarding testing for "a point of efficiency" and merely teaches exercising at "*50% to 60% of heart rate reserve and increased to 80% to 85% by the third-fourth month and continued at that level for the remaining time.*" The heart rate reserve is a number that is not individualized, but is one that is assigned to a general group of the same age and sex. The determined rate of change of the performance of an individual is not the core of determining his point of efficiency. Rather, a precalculated step-like function governs the entire process in Stratton. In the present claim limitations, the performance of the individual is used to develop the linear proportional rate of change

in a certain parameter, and any less or more rapid change in the linear proportional rate of change determines that deviation from efficiency.

The Examiner has stated that "The current claim language does not explicitly link the point of efficiency to any user or any trainee." (Final Office Action, Response to Arguments, Section 4). This, however, is not the case. Claim 1 specifically requires "determining for a given activity a point of efficiency of *a trainable subject*" (emphasis added). Therefore, unlike, the Hall-Tipping reference and the Stratton reference the present invention as described by Claim 1 creates a point of efficiency for each individual user based on their performance and not on predetermined step-like functions.

Thus, even combining the teachings of the prior art references leaves a fundamental difference as observed when dealing with the state of efficiency. The present invention refers to a linear proportional *rate of change* in a parameter (more rapid or less rapid change) when determining the state of efficiency whereas the cited references both refer to a step-like function of efficiency, a rigid range, the falling out of which dictates a state of departure from efficiency.

Based on the preceding arguments, Applicant respectfully maintains that Claim 1 in view of Hall-Tipping (US 5,001,632) and further in view of Stratton et al. is in condition for allowance. Claims 4-8 depend on Claim 1 and as Claim 1 is in a condition for allowance and is not unpatentable, applicant respectfully submits that Claims 4-8 are likewise in a condition for allowance.

Regarding Claim 17:

The Examiner rejected Claim 17 in view of Hall- Tipping (US 5,001,632) in view of Stratton et al. Although the disclosure of Hall-Tipping does talk about an "optimal level" of activity, the optimal level is a predetermined range of pulse rate to be between 70% to 80-85% using the formula of 220 minus the user's age in years (see Hall-Tipping col. 5, lines 35-45). Hall-Tipping further discloses that the exerciser must exercise optimally, which means that the exerciser must bear a heart rate falling between the locked in precalculated range, i.e. P max and P min (see Hall-Tipping col. 6, lines 1-11).

The Examiner, however, has asserted that "The Hall-Tipping reference provides a teaching where point of efficiency is determined continuously over a period of time (see FIG. 3 item "warm-up")." (Final Office Action, Response to Arguments, section 3). On the contrary, FIG. 3 actually discloses that there is an initial period a "warm-up" period where the user's heart rate is slowly raised over a given amount of time. The Hall-Tipping reference states that "An exerciser, prior to commencing a workout, inputs his age, and the preferred duration of his warm-up and workout. According to a preset formula, the controller sets upper and lower heart rates for the duration of the exercise routine." (Col. 4, Lines 36-40). The "Warm-up period – between 5 and 10 minutes. The heart beat should not exceed 50% of the user's maximal heart rate at the conclusion of the warm-up period." (Col. 5, Lines 45-48). Therefore, the "warm-up" period is not used to determine a point of efficiency instead all of the heart rate ranges are predetermined by the user inputting his age and the type of workout he wants. The "warm-up" period is simply a period where the user's heart rate is raised to 50% of the predetermined maximum rate from a resting heart rate (FIG. 3).

The present claim does not call for a precalculated range for determining efficiency. Rather, the efficiency is determined by the *rate of change* in a parameter. Efficiency is said to be maintained when the rate of change in a parameter is in proportion to the stimulus, like speed or distance. If the rate of change in a parameter changes out of proportion or is not along the line formed by the graph of the two values (see Applicant's figs, 2B and 3) to be compared (see Applicant's specification: page 12, lines 16-19), then such more rapid or less rapid variation is considered an indication of inefficiency as displayed by the subject while exercising (see Applicant's specification: page 13, lines 7-12). This method is completely different from using a precalculated locked in range for presuming efficiency. The present claim limitations let the individual user demonstrate and determine his (or her) rate-derived level of efficiency as opposed to a step-like function described in the prior art references.

The Applicant respectfully draws the attention of the examiner to the fact that the disclosure of Stratton et al. makes no determination of a point of efficiency for the given exercises, but rather the subjects train at a predetermined percentage of maximum heart rate reserve for 45 minutes (See *Training Program and Maximal Oxygen Consumption,* p. 1649). Stratton et al. is also silent with regards to the percentage of consumption derivation. Radionuclide studies performed in Stratton et al. were used to determine left ventricular volume of subjects during exercise where the speed of a supine bicycle was increased until the subjects reached exhaustion (See *Study Protocol*). In addition, the protocol was ***identical*** for all subjects which would be contrary to using individual points of efficiency for training each subject.

As discussed above, the training in Stratton et al. discloses predetermined heart rate target sets for stepped periods of 45 minutes for all subjects. The exercising of a subject at an arbitrary heart rate reserve is a number that is not attributed directly to an individual, but to a general group of the same age and sex and thus unknown if the subject was near either the "point of efficiency" or "range of tolerance." The present claim, in comparison, requires an individualized method of determining the rate-derived point of efficiency.

The Examiner has stated that "The current claim language does not explicitly link the point of efficiency to any user or any trainee." (Final Office Action, Response to Arguments, Section 4). Claim 17, as amended, specifically requires "determining an at least one point of efficiency parameter of the subject". Therefore, unlike, the Hall-Tipping reference and the Stratton reference the present invention as described by Claim 17 creates a point of efficiency for each individual user based on their performance and not on predetermined step-like functions.

Hence, even if the teachings of both Hall-Tipping and Stratton et. al. were combined, one could not find it obvious to derive the method of the present claim limitations as alleged by the Examiner. A fundamental difference is observed when dealing with the state of efficiency. The claims proscribe a *linear proportional rate of change* in a parameter (more rapid or less rapid change) when determining the state of efficiency whereas the cited references, both, refer to a step-like function of efficiency, a rigid range or point (% heart rate, P max, P min, exhaustion point), wherein the falling out of a predetermined, precalculated parameter value, dictates a state of departure from efficiency.

Based on the preceding arguments, Applicant respectfully maintains that Claim 17, as amended, in view of Hall-Tipping (US 5,001,632) and further in view of Stratton et al. is in condition for allowance. Claims 18-20 depend on Claim 17, as amended, and as Claim 17 is in a condition for allowance and is arguably not unpatentable, Applicant respectfully submits that Claims 18-20 are likewise in a condition for allowance.

CONCLUSION

Based on the preceding arguments, Applicant respectfully believes that all pending claims and the entire application meet the acceptance criteria for allowance and therefore request favorable action. If the Examiner believes that anything further would be helpful to place the application in better condition for allowance, Applicant invites the Examiner to contact Applicant's representative at the telephone number listed below. The Director is hereby authorized to charge and/or credit Deposit Account 19-0513.

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